

## **REMARKS**

### **Summary of Office Action**

Applicant's claims 1-18 are currently pending in the above-identified patent application.

The Examiner rejected independent claims 1 and 11 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent 3,041,486 (hereinafter "Moffitt") and under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent 6,472,841 (hereinafter "Piedl").

The Examiner has also rejected claims 5 and 13 under 35 U.S.C. § 103(a) as being unpatentable over either Moffitt or Piedl in view of Japanese Patent Publication JP2001-191931 (hereinafter "Takahashi").

The Examiner has allowed independent claim 18.

### **Summary of Applicant's Reply**

Applicant has amended the claims, as reflected under the heading Listing of Claims beginning on page 2 of this paper, in order to more particularly define Applicant's claimed invention.

### **Applicant's Reply to the Rejection of the Claims**

The Examiner rejected independent claims 1 and 11 under 35 U.S.C. § 102(b) as being anticipated by Moffitt and under 35 U.S.C. § 102(e) as being anticipated by Piedl. The Examiner also rejected claims 5 and 13 under 35 U.S.C. § 103(a) as being unpatentable over either Moffitt or Piedl in view of Takahashi. Applicant has proposed amending the claims, as reflected under the heading Listing of Claims beginning on page 2 of this paper. The Examiner's rejections are respectfully traversed.

Applicant's claimed invention is a variable reluctance resolver provided with output windings having a reduced effect from externally introduced leakage magnetic flux. Windings are wound such that the polarities of output voltages on output windings will be the same. The output windings are wound around at least three adjacent magnetic poles, divided into an even number of groups consisting of at least two groups, and are serially connected so that adjacent group voltage polarities mutually differ.

In Applicant's claimed invention, the number of turns made for output windings within a group is determined by the output windings' position within the group, as well as with respect to adjacent groups. More specifically, the output windings within each group are wound so that the number of turns made for output windings positioned on either end of the group (i.e., the ends of the group adjacent to other groups) are smaller than the number of turns made for the output windings positioned further away from either end and closer to the center of the group.

A group consisting of five magnetic poles numbered consecutively 1-5, for example, would have two outermost magnetic poles (i.e., magnetic poles 1 and 5), which are adjacent to the outermost magnetic poles of adjacent groups. Therefore, the output windings wound around magnetic poles 1 and 5 would have fewer turns than the output windings wound around center magnetic pole 3, which is the furthest away from the outermost magnetic poles 1 and 5 of its group. The output windings wound around magnetic poles 2 and 4 of the group would have more turns than the output windings wound around the outermost magnetic poles 1 and 5 but fewer turns than the output windings wound around center magnetic pole 3.

#### **Independent Claims 1 & 11**

In rejecting Applicant's independent claims 1 and 11, the Examiner asserts that all of the elements of these claims are shown in Moffit and Piedl. *Office Action, Pages 3-4*. However, Applicant respectfully submits that Moffit and Piedl fail to show or suggest that "each group has outermost output coils and output coils between the outermost output coils wherein the number of turns of each of the outermost output coils is less than the number of turns of the output coils between the outermost output coils." This is an important distinction between Applicant's claimed invention and the cited references in that the output windings in Applicant's claimed invention are wound in such a way so as to address the effects of externally introduced leakage magnetic flux. Accordingly, this limitation has been incorporated into amended independent claims 1 and 11.

#### **Claims 5 & 13**

The Examiner rejected Applicant's claims 5 and 13 under 35 U.S.C. §103(a) as being unpatentable over either Moffitt or Piedl in view of Takahashi. *Office Action, Pages 5*. The drawings were also objected to under 37 C.F.R. §1.83(a) because the feature of a magnetic shield recited in claims 5 and 13 is not shown in the drawings.

Applicant recognizes that there are methods of resolving the negative effects arising from external magnetic fields using various magnetic shielding materials placed on parts of a device. Applicant further recognizes that such shielding materials are expensive, unnecessarily contribute to the size of a device and, most importantly, are at times inefficient due to the difficulty in determining the direction of external magnetic flux and effective placement of the shielding material. However, Applicant addresses the effects of externally introduced leakage magnetic flux through the winding methods described earlier as being employed in Applicant's claimed invention. Applicant only points out that known magnetic shielding materials may also be incorporated into the variable reluctance resolver of Applicant's claimed invention, resulting in a further diminution of the effects of external magnetic fields.

In light of the aforementioned, Applicant has canceled claims 5 and 13. Therefore, the Examiner's rejection of claims 5 and 13 and objection to the drawings are no longer at issue.

### **Conclusion**

Accordingly, Applicant respectfully submits that the claimed invention as defined by independent claim 1, claims 3 through 10 which depend therefrom, independent claim 11, claims 13 through 17 which depend therefrom, and independent claim 18 are patentable over the cited references.

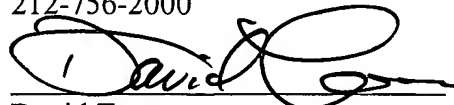
For at least the reasons set forth above, Applicant respectfully submits that this patent application, as amended, is in condition for allowance. Reconsideration and prompt allowance of this application are respectfully requested.

Respectfully submitted,

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